

CLAIMS

What is claimed is:

1. A method of transmission power control for a wireless transmit receive unit (WTRU) that transmits data signals in a forward channel where the WTRU is configured to make forward channel power adjustments as a function of target metrics computed based on the data signals as received over the forward channel, the method comprising:

receiving data signals from the WTRU on the forward channel;

computing target metrics for the WTRU's forward channel power adjustments based on the detection of predetermined error conditions in the signals received on the forward channel including:

setting an initial target metric value;

after a preliminary period at the initial value, changing the target metric by a step up or a step down amount at time intervals of a predetermined length whereby the target metric is increased by the step up amount if a predetermined error condition has been detected in an immediately preceding time interval or is decreased by the step down amount if the predetermined error condition has not been detected the immediately preceding time interval; and

setting the step up and step down amounts at a first relatively high transient state level and reducing the step up and step down amounts by a selected amount if a predetermined error condition has been detected in an immediately preceding time interval until they are reduced to a second relatively low steady state level.

2. The method of claim 1 wherein the computing target metrics further includes increasing the step up and step down amounts by a selected amount if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

3. The method of claim 1 in which the target metrics are target signal to interference ratios (SIRs) and cyclic redundancy checks are conducted to detect the predetermined error condition.

4. The method of claim 3 wherein step up amounts are significantly greater than respective step down amounts, the first level of step up and step down amounts are a factor of 2^n greater than the second level of step up and step down amounts, where n is a positive integer, and the step up and step down amounts are reduced by a factor of $1/2$ if a predetermined error condition has been detected in an immediately preceding time interval until they are reduced to the second level.

5. The method of claim 4 wherein the computing target metrics further includes increasing the step up and step down amounts by a factor of 2 if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

6. The method of claim 4 wherein the computing target metrics further includes increasing the step up and step down amounts to the first level if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

7. The method of claim 3 wherein the WTRU is a network unit that transmits user signals on a downlink channel and the computing of target metrics is performed by a WTRU that receives the downlink channel.

8. The method of claim 3 in which closed loop transmission power control for the WTRU is implemented further comprising:

producing power step commands as a function of the computed target SIRs and transmitting the power step commands on a reverse channel; and

receiving the power step commands by the WTRU on the reverse channel and computing power adjustments for forward channel transmissions based on the received power step commands.

9. The method of claim 10 wherein the method is implemented in a third generation partnership program (3GPP) wideband code division multiple access (W-CDMA) system where the WTRU is a network unit that transmits user signals on a downlink channel and the computing of target metrics is performed by a WTRU that receives the downlink channel and produces power step commands that are transmitted to the network unit on an uplink channel.

10. A receiving wireless transmit receive unit (WTRU) for implementing transmission power control for a transmitting WTRU that transmits data signals in a forward channel where the transmitting WTRU is configured to make forward channel transmission power adjustments as a function of target metrics computed by the receiving WTRU, the receiving WTRU comprising:

- a receiver for receiving data signals from a transmitting WTRU on a forward channel;

- a processor for computing target metrics for implementing forward channel transmission power adjustments in the transmitting WTRU based on the detection of predetermined error conditions in the data signals received on the forward channel;
- and

- said processor configured to compute target metrics such that:

- after a preliminary period at an initial value, the target metric is changed by a step up or a step down amount at time intervals of a predetermined length whereby the target metric is increased by the step up amount if a predetermined error condition has been detected in an immediately preceding time interval or the target metric is decreased by the step down amount if the predetermined error condition has not been detected in the immediately preceding time interval; and

the step up and step down amounts are set a first relatively high transient state level and are reduced by a selected amount if a predetermined error condition has been detected in an immediately preceding time interval until they are reduced to a second relatively low steady state level.

11. The invention of claim 10 wherein said processor is further configured to compute target metrics such that the step up and step down amounts are increased by a selected amount if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

12. The invention of claim 10 in which the target metrics are target signal to interference ratios (SIRs) and the receiving WTRU is configured to conduct cyclic redundancy checks to detect the predetermined error condition.

13. The invention of claim 12 wherein said processor is configured to compute target metrics such that step up amounts are significantly greater than respective step down amounts of a given level, the first level of step up and step down amounts are a factor of 2^n greater than the second level of step up and step down amounts, where n is a positive integer, and the step up and step down amounts are reduced by a factor of $1/2$ if a predetermined error condition has been detected in an immediately preceding time interval until they are reduced to the second level.

14. The invention of claim 13 wherein said processor is further configured to compute target metrics such that the step up and step down amounts are increased by a factor of 2 if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

15. The invention of claim 13 wherein said processor is further configured to compute target metrics such that the step up and step down amounts are increased to the first level if a predetermined error condition has not been detected in a predetermined number of time intervals while they are set at the second relatively low steady state level.

16. The invention of claim 12 where the transmitting WTRU is a network unit that transmits user signals on a downlink channel wherein the receiving WTRU is configured to compute target metrics based on the detection of predetermined error conditions in the data signals received on the downlink channel.

17. The invention of claim 12 in which closed loop transmission power control for the transmitting WTRU is implemented wherein the receiving WTRU processor is further configured to produce power step commands as a function of the computed target SIRs and the receiving WTRU further comprising a transmitter configured to transmit the power step commands on a reverse channel to the transmitting WTRU.

18. The invention of claim 17 which is implemented for use in a third generation partnership program (3GPP) wideband code division multiple access (W-CDMA) system where the transmitting WTRU is a network unit that transmits user signals on a downlink wherein the receiving WTRU is configured to compute target metrics based on the detection of predetermined error conditions in the data signals received on the downlink channel.